

# Manipulating time instead of just counting it

By Dig Magazine, adapted by Newsela staff on 12.12.17

Word Count 760

Level 790L



Image 1: People are fascinated by the idea of traveling through time. Many movies, books and TV shows have explored what it might be like to do so. This poster was made for a movie that came out in 1960 based on the book "The Time Machine" by H.G. Wells which was published in 1895. Photo from: Movie Poster Image Art/Getty Images

What if we had the power to control time, instead of moving from the past to the present to the future? What if we could jump, loop and travel through time in a machine? What if we could go wherever and whenever we pleased?

This ability would allow us to witness historic wonders, change decisions and see people from the past. We could right wrongs and stop wars from starting.

The mysterious puzzle of time has kept people debating its nature for hundreds of years. Science fiction writers have plotted it backwards and forwards into imaginative stories. Some scientists have even attempted to explain it using mathematical equations. This math tries to make the dream of time travel come true.

## Moving Through Spacetime

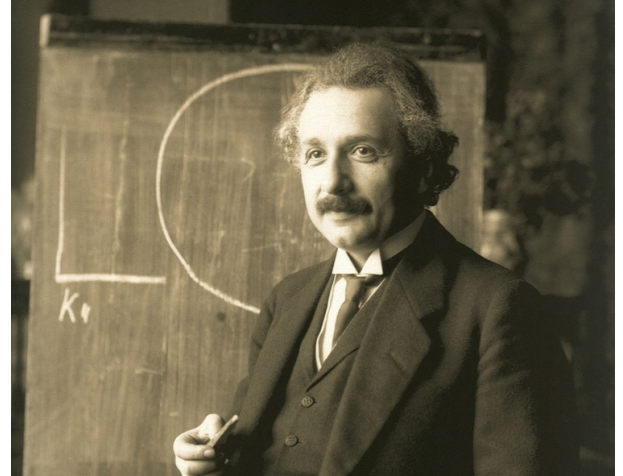
The scientist Albert Einstein said that time and space are one thing. He called it "spacetime." Einstein said that there are three dimensions in space: height, width and depth. A scientist named

Hermann Minkowski added time as a fourth dimension.

Einstein introduced two ideas that have led to theories about the possibility of time travel. The first involves relativity. The idea of relativity is that the force of gravity causes space to curve, which causes time to twist. The second idea focuses on special relativity. Gravity is not involved in this theory. Rather, the idea is that a traveler moving super-fast through flat spacetime will enter the future. Einstein considered time "relative" because it is measured based on where we are on Earth or in space.

### **Science Fiction Writers Guess The Rules**

Ray Cummings was an American science fiction writer. In his 1921 book "The Time Professor," he wrote that "time is nature's way of keeping everything from happening at once." Other science fiction writers have also addressed the concept of time. There appears to be an agreement among them about the following:



No known rules of physics prevent time travel.

You cannot change or alter the past. You can only discuss it.

You cannot go faster than the speed of light and survive.

A time machine with a human inside would require tons of energy to plunge through time.

You cannot travel back to a time before your time machine was created.

There are exceptions to every rule.

### **If It's Possible, Then Why Aren't Future People Visiting Us?**

The famous scientist Stephen Hawking believes that a time machine will never be built. If it were possible, he thinks we would already know. "Why haven't we been invaded by hordes of travelers from the future?" he asks.

If you could go back in time, your presence in the past could cause events to go out of whack. This would create questions and chaos. What if while traveling back, you accidentally kill an ancestor? Does that mean you will not be born? For people who believe in "multi-dimensional worlds," this and other questions can be avoided. These people say that when a person travels to the past, the universe immediately splits into other worlds. These worlds are similar, but they are not exactly the same.

### **Exploring The Idea**

The first science fiction story with this theme is "The Clock That Went Backward" by Edward P. Mitchell. It was published in 1881. Since then, thousands of books, films and television shows have explored the idea of time travel. The concept is portrayed as tricky and unpredictable. Consequences often involve mad scientists, broken time machines and people stuck in the wrong time period.

Other devices take travelers backward and forward. These tools include phones, gadgets, watches, photographs and an old book. Time machine devices include a police telephone booth in the British sci-fi show "Doctor Who" and a DeLorean sports car in "Back to the Future." In the movie "Superman," the hero flies backward around Earth so fast that it rewinds time. This turns him into a human time machine. Superman is able to reverse events and bring his friend Lois Lane back to life.



Will time travel ever happen? Who knows? For now it remains in the realm of science fiction.

## Quiz

1 Which detail from the text MOST CLEARLY shows what many science fiction writers think about time travel?

- (A) We could right wrongs and stop wars from starting.
- (B) This math tries to make the dream of time travel come true.
- (C) No known rules of physics prevent time travel.
- (D) If it were possible, he thinks we would already know.

2 Read the selection from the section "If It's Possible, Then Why Aren't Future People Visiting Us?"

*If you could go back in time, your presence in the past could cause events to go out of whack. This would create questions and chaos. What if while traveling back, you accidentally kill an ancestor? Does that mean you will not be born? For people who believe in "multi-dimensional worlds," this and other questions can be avoided. These people say that when a person travels to the past, the universe immediately splits into other worlds. These worlds are similar, but they are not exactly the same.*

What conclusion can the reader make based on this paragraph?

- (A) People have many questions about what would happen if people traveled in time.
- (B) People should not travel to the past because it will cause problems with the present.
- (C) People have not traveled in time because we have not had visitors from the future.
- (D) People who travel to the future will cause the universe to split into two separate worlds.

3 Read the article's introduction and the final section.

What is the connection between those two sections?

- (A) The introduction highlights scientific information that shows why time travel is possible, while the final section illustrates why time travel would be dangerous for people.
- (B) The introduction highlights scientific information that shows why time travel is possible, while the final section focuses on popular books, films and shows about time travel.
- (C) The introduction explains that both writers and scientists have been interested in time travel, while the final section illustrates why time travel would be dangerous for people.
- (D) The introduction explains that both writers and scientists have been interested in time travel, while the final section focuses on popular books, films and shows about time travel.

4 Read the section "Moving Through Spacetime."

How does this section contribute to the article's main idea?

- (A) It illustrates how two scientists proved that time travel could happen.
- (B) It explains why scientists do not believe that time travel is possible.
- (C) It highlights a scientist whose ideas support the idea of time travel.
- (D) It describes some theories that prove that time travel is dangerous.

## Answer Key

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